

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/000354

International filing date (day/month/year)
02.02.2005

Priority date (day/month/year)
06.02.2004

International Patent Classification (IPC) or both national classification and IPC
F04D29/66; F16F15/04; F16L27/11

Applicant
THE BOC GROUP PLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 65.1b(5) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
 - ☒ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
 - ☐ complied with
 - ☒ not complied with for the following reasons:
 see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
 - ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	12, 16-30
	No: Claims	1-11, 13-15, 31
Inventive step (IS)	Yes: Claims	12, 16-30
	No: Claims	1-11, 13-15, 31
Industrial applicability (IA)	Yes: Claims	1-31
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item IVLack of unity of invention

This Authority considers that there are 2 inventions covered by the claims indicated as follows:

I: Claims 1-17, 19-31 directed to a pre-compressed damper and to a pump comprising such a damper;

II: Claim 18 directed to a damper comprising resistive means subjected to a tensile force. The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The prior art has been identified as document WO 01/51817.A1 and discloses (see fig. 1): a vibration damper for inhibiting transfer of vibrations to an apparatus during the evacuation thereof by a pump 1, the damper comprising a bellows arrangement 8 for isolating from the ambient atmosphere, fluid drawn from the apparatus by the pump 1, and means 9 for limiting axial compression of the bellows arrangement 8 during use of the damper.

It follows that the following technical feature of claim 1 makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

a pre-compression of the damper:

The problem solved by this special technical feature can therefore be construed as: how to improve vibration transmission properties of the damper.

On the other hand, a special technical feature of claim 18 is:

resistive means arranged about an axis and under tension in such a way that when damper is subjected to an external axial force tending to compress the bellows arrangement, the resistive means is subjected to a tensile force, the resistance to extension of the resistive means opposing axial compression of the bellows arrangement. The problem solved by this special technical feature can therefore be construed as: to provide alternative solution for means for limiting axial compression of the bellows arrangement.

Neither the special technical feature of the claim 1 nor any other corresponding feature is present in the claim 18. Also, examining the possible correspondence by technical effect, one finds that the technical effect of the first invention is a higher stiffness characteristic at lower displacement and that the technical effect of the second invention is avoiding of a

buckling failure mode.

This appears to show lack of corresponding technical effect as well. Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 2 different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

0. Reference is made to the following documents:

D1: US-A-3 000 389 (ALSAGER LESLIE E ET AL) 19 September 1961 (1961-09-19)

D2 : PATENT ABSTRACTS OF JAPAN vol. 1998, no. 14, 31 December 1998 (1998-12-31) & JP 10 252963 A (TOOFURE KK), 22 September 1998 (1998-09-22)

D3: WO 01/51817 A (LEYBOLD VAKUUM GMBH; ADAMIETZ, RALF; BEYER, CHRISTIAN; ENGLAENDER, HEI) 19 July 2001 (2001-07-19)

1. Independent claim 1:

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

The document D1 discloses (see the figure):

a vibration damper for inhibiting transfer of vibrations to an apparatus 12 during the evacuation thereof by a pump 15, the damper comprising a bellows arrangement 30 for isolating from the ambient atmosphere 34, fluid drawn from the apparatus by the pump, and means 37 for limiting axial compression of the bellows arrangement during use of the damper, wherein the damper is axially pre-compressed (at a compressible ring 35 of

rubber or rubber-line material which functions to provide a watertight seal).

2. Claims 2-11, 13-15, 31:

Dependent claims 2-11, 13-15, 31 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty, see documents D1 and D2.

3. Claim 12:

The combination of the features of dependent claim 12 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

The document D3 is regarded as being the closest prior art to the subject-matter of claim 12, and shows (see fig. 2) a vibration damper for inhibiting transfer of vibrations to an apparatus during the evacuation thereof by a pump. The damper comprises all of the features of the present independent claim 1 and of the dependent claims 9-11. Moreover D3 discloses a feature a V-shaped members (claim 12) for limiting axial extension of the bellows. Nevertheless neither D3 nor any other document from the documents cited in the search report shows such V-shaped members co-operating to draw the ends of the bellows arrangement so as to pre-compress the damper. As a result the dependent claim 12 seems to represent a new and inventive subject-matter.

4. Independent claim 18:

The document D3 is regarded as being the closest prior art to the subject-matter of claim 18, and shows (see fig. 2):

a vibration damper 7 for inhibiting transfer of vibrations to an apparatus during the evacuation thereof by a pump 1, the damper 7 comprising a bellows arrangement 8 for isolating from the ambient atmosphere, fluid drawn from the apparatus by the pump 1, the bellows arrangement 8 extending about an axis, and resistive means 9 arranged about said axis.

The subject-matter of claim 18 differs from this known vibration damper in that the resistive means is provided under tension in such a way that when the damper is subjected to an external axial force tending to compress the bellows arrangement, the resistive means is

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subjected to a tensile force, the resistance to extension of the resistive means opposing axial compression of the bellows arrangement.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to provide alternative solution for means for limiting axial compression of the bellows arrangement.

The solution to this problem proposed in claim 18 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

by the provision the resistive means subjected to a tensile force it is possible to avoid a buckling failure mode of the resistive means, which solution for the resistive means is not suggested by any of the documents cited in the search report.